

**Notice of Allowability**

Application No.

10/084,860

Applicant(s)

JAMES ET AL

Examiner

Ngoc-Yen M. Nguyen

Art Unit

1754

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/28/2002.
2. ☒ The allowed claim(s) is/are 1-5, 7-10, 12 and 13.
3. ☒ The drawings filed on 28 February 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

Ngoc-Yen M. Nguyen  
Primary Examiner  
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### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms. Janet Cord on March 22, 2004.

The application has been amended as follows:

Claim 1 (amended): A [single step] process for synthesis of nanoparticles of phase pure ceramic oxides of a multi-component system comprising [one] two or more metal ions, said process comprising[,];

- (a) preparing a solution containing the metal ions [in stoichiometric ratio] by dissolving their [soluble] metal salts in an organic solvent or in water[,];
- (b) preparing a precursor by complexing the metal ions with a complexing agent while keeping the ratio of the charges of the complexing agent [acid] to the charges of the metal ions as unity wherein said precursor is formed in the solution;
- (c) [adjusting the nitrate/ammonia content in the system] adding nitric acid and ammonia; nitric acid and ammonium hydroxide; or ammonium nitrate to the solution to adjust the nitrate and ammonia content of the solution; and

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- (d) heating the [system] solution formed in step (c) from room temperature to 250-300°C to produce a foam which subsequently ignites to provide a combustion product comprising the nanoparticles.

Claim 2 (amended): [A] The process as claimed in claim 1 wherein the ceramic oxide produced [desired oxide] contains [(a) one cation selected from the group comprising  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{TiO}_2$ ,  $\text{CeO}_2$ ,  $\text{HfO}_2$ ,  $\text{MgO}$ ,  $\text{SiO}_2$ , (b)] (a) two cations of the general formula  $\text{ABO}_3$ , wherein A is Si, Al, Y or Lanthanides, B is Ba, Sr, Ca, Mg or Fe; or with general formula  $\text{AlM}_2\text{O}_5$ , where M = Ti, Zr or Hf; or with general formula  $\text{Al}_2\text{NO}_4$ , where N = Mg, Ca, Sr, Ba, Zn[,]; [(c)] (b) three cations with the general formula  $\text{A}(\text{B}_{0.5}\text{B}'_{0.5})\text{O}_6$  or  $\text{A}_2(\text{BB}')\text{O}_6$ , where A is Ba, Sr, Ca or Mg, B is Zr, Hf, Sb or Sn, B' is Al, Y or Lanthanides, [(d)] (c) four cations with general formula  $(\text{AA}')(\text{BB}')\text{O}_6$ , where A and A' are B, Sr, Ca or Mg, B is Zr, Hf, Sb or Sn, B' is Al, Y or Lanthanides.

Claim 3 (amended): [A] The process as claimed in claim 1 wherein the complexing agent is selected from the group [comprising] consisting of citric acid, EDTA and oxalic acid.

Claim 4 (amended): [A] The process as claimed in claim 1 wherein the metal salts are dissolved in an organic solvent and the nitrate and ammonia [nitrate/ammonia] content in the solution [system] is adjusted by addition of ammonium nitrate [where the precursor is formed in an organic solvent].

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Claim 5 (amended): [A] The process as claimed in claim 1 wherein the metal salts are dissolved in water and the nitrate and ammonia [nitrate/ammonia] content in the solution [system] is adjusted by the addition of nitric acid and ammonia or ammonium nitrate [where the precursor complex is formed in water].

Cancel claim 6.

Claim 7 (amended): [A] The process as claimed in claim 1 wherein the metal salts are selected from the group [comprising] consisting of alkoxides, nitrate, chlorides, sulphates, oxychlorides or any other salts that are soluble in an organic solvent.

Claim 8 (amended): [A] The process as claimed in claim 1 wherein the metal salts are water insoluble [oxides and carbonates of the desired metal] and are dissolved in suitable acids prior to [use] step (a).

Claim 9 (amended): [A] The process as claimed in claim 1 wherein the organic solvent is selected from the group comprising of alcohols, trichloroethylene, and any other solvents capable of dissolving the complexing agent and [any one of] the metal salts [needed to form the desired oxide].

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Claim 10 (amended): [A] The process as claimed in claim 9 wherein the alcohol is selected from the group [comprising] consisting of ethyl alcohol, methyl alcohol and isopropyl alcohol.

Cancel claim 11.

Claim 12 (amended): [A] The process as claimed in claim 11 wherein the heating is done on a sand bath or hot plate [bath/hot plate].

Claim 13 (new): The process as claimed in claim 8 wherein the metal salts are oxides or carbonate salts.

The following is an examiner's statement of reasons for allowance: the prior art does not teach or suggest a process for producing nanoparticles of phase pure ceramic oxides of a multi-component comprising the steps of mixing the reactants and heating the resulting mixture to form a foam and then igniting to form the a combustion product comprising the nanoparticles.

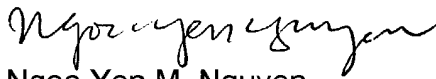
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stan Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.

  
Ngoc-Yen M. Nguyen  
Primary Examiner  
Art Unit 1754

nmn  
March 22, 2004